

Patent Claims:

1. A device for adjusting rotation angles, in particular of electrical rotary switches (1), having a stator (2), which has a receptacle (8) which is open on one side (6) and is approximately in the form of a pot, having a rotor (3) which is mounted on the stator (2) such that it can rotate in the receptacle (8) as a rotary bearing, such that the rotor (3) can be moved between at least two rotation angle positions, having a magnet (4), which can be moved by means of the rotor (3), and having a magnetic field sensor (5), which is associated with the magnet (4), in order to produce a signal which corresponds to the rotation angle position, the magnetic field sensor (5) being arranged in the receptacle (8) on the stator (2) and/or on a part which is mounted in the stator (2), such that the stator (2) acts as a mount for the magnetic field sensor (5), characterized in that the magnet (4) is arranged on the rotation axis of the rotor (3), in that the magnetic field sensor (5) is in the form of a Hall sensor which is two-dimensionally sensitive for magnetic fields parallel to its chip surface, and in that the magnetic field sensor (5) is mounted on that side (7) of the receptacle (8) which faces away from the open side (6), [lacuna] lower face of the stator (2) which is located [lacuna].

2. The device for adjusting rotation angles as claimed in claim 1, characterized in that the stator (2) and/or the rotor (3) are/is composed of plastic, in particular of a thermoplastic, for example of polyamide, in that the stator (2) and/or the rotor (3) are/is preferably produced as an injection-molded part, and in that, furthermore, the magnet (4) is preferably in the form of a cylindrical permanent magnet which is magnetized two-dimensionally, diametrically.

3. The device for adjusting rotation angles as claimed in claim 1, characterized in that the rotor (3) is located essentially, in particular completely, in the receptacle (8) such that a surface (25) of the receptacle (8) which is located in the interior of the stator (2) acts as a rotating bearing, and in that latching elements (26) preferably interact between the stator (2) and the rotor (3) such that the rotor (3) is secured in the receptacle (8) such that it cannot fall out.

4. The device for adjusting rotation angles as claimed in claim 1, characterized in that conductor tracks (9) for electrical connection of the magnetic field sensor (5) are located in the stator (2) and in that the conductor tracks (9) preferably extend into the receptacle (8), with the conductor tracks (9) in particular being the part that is mounted in the stator (2), for arrangement of the magnetic field sensor (5).

5. The device for adjusting rotation angles as claimed in claim 1, characterized in that the conductor tracks (9) are in the form of a stamped grid composed of metal, in particular with the stamped grid being injected into the plastic for the injection-molded part during the production of the stator (2).

6. The device for adjusting rotation angles as claimed in claim 1, characterized in that the conductor tracks (9) are incorporated in the stator (2) in the form of an MID (Molded Interconnected Device) component, for example by means of metalized plastic for the conductor tracks (9).

7. The device for adjusting rotation angles as claimed in claim 1, characterized in that the magnetic field sensor (5) is in the form of an encapsulated chip with connections (11), in particular in the form of an SMD (Surface Mounted Device) component, with the connections (11) being soldered to the conductor tracks (9) in order to make electrical contact.

8. The device for adjusting rotation angles as claimed in claim 1, characterized in that the magnetic field sensor (5) is in the form of an unencapsulated chip, with bonding wires (24) which, in particular, are welded to the chip being used to make electrical contact with the conductor tracks (9).

9. The device for adjusting rotation angles as claimed in claim 1, characterized in that the exterior of the stator (2) is in the form of a housing (12), in that latching and/or snap-action hooks (13) are preferably arranged on the housing (12) in order to mount the stator (2) on a holder (14), in particular with the open side (6) of the receptacle (8) in the stator (2) facing the holder (14).

10. The device for adjusting rotation angles as claimed in claim 1, characterized in that the holder (14) is a printed circuit board which, if required, is provided with a panel for an electrical appliance or the like, in particular with the conductor tracks (9) in the stator (2) making contact with associated conductor tracks on the printed circuit board, and in that an electronic device (15) for evaluation of the signals produced by the magnetic field sensor (5) is preferably located on the printed circuit board.

11. The device for adjusting rotation angles as claimed in claim 1, characterized in that, on the open side (6) of the receptacle (8), the rotor (3) has a recess (18) for the insertion of a handle (16), for example by means of a shaft (17), in order to rotate it manually.

12. The device for adjusting rotation angles as claimed in claim 1, characterized in that the handle (16) is located on that side of the holder (14) which faces away from the housing (12), and in

that an opening (19) which corresponds to the open side (6) of the receptacle (8) in the stator (2) is preferably located in the holder (14), through which opening (19) the shaft (17) passes for insertion into the recess (18).

13. The device for adjusting rotation angles as claimed in claim 1, characterized in that the rotation angle positions of the rotor (2) are in the form of latching positions.

14. The device for adjusting rotation angles as claimed in of claim 1, characterized in that an electrical switch is located in the housing (12) as a mains switch.

15. The device for adjusting rotation angles as claimed in claim 1, characterized in that the magnet (4) is mounted on an intermediate piece (21), and in that the intermediate piece (21) is mounted on the rotor (8), in particular such that it can rotate.

16. The device for adjusting rotation angles, in particular of electrical rotary switches (1), as claimed in one of the preceding claims, having a stator (2), having a rotor (3) which is mounted on the stator (2) such that it can rotate, such that the rotor (3) can be moved between at least two rotation angle positions, having a magnet (4) which can be moved by means of the rotor (3) and having a magnetic field sensor (5), which is associated with the magnet (4) in order to produce a signal which corresponds to the rotation angle position, characterized in that the magnet (4) is arranged such that it can be moved in order to adjust its position with respect to the rotor (3), so as to allow adjustment of the position of the magnet (4) when the rotor (3) is in one rotation angle position.

17. The device for adjusting rotation angles as claimed in claim 16, characterized in that the magnet (4) is mounted on the rotor (3) such that it can rotate, in particular in a receptacle (20), which faces the magnetic field sensor (5), in the rotor (3).

18. The device for adjusting rotation angles as claimed in claim 16, characterized in that an adjusting means for adjusting the position of the magnet (4) is arranged between the magnet (4) and the rotor (3), preferably with the adjusting means being in the form of an intermediate piece (21) which is mounted in particular in the receptacle (20) on the rotor (3) such that it can rotate, and with the magnet (4) furthermore preferably being mounted on the intermediate piece (21).

19. The device for adjusting rotation angles as claimed in claim 16, characterized in that the magnet (4) is accessible for adjustment from the outside of the stator (2), in particular through a receptacle (8) in the stator (2) which is open on one side (6) and is used as a rotating bearing for the rotor (3), and with an aperture (22) preferably being located in the rotor (3).

20. The device for adjusting rotation angles as claimed in claim 16, characterized in that the aperture (22) extends from that surface of the rotor (3) which faces the open side (6) of the receptacle (8) to the magnet (4) and/or to the intermediate piece (21), and in that a type of Torx, cruciform slot or similar receptacle (23) is located in the magnet (4) and/or in the intermediate piece (21), preferably facing the aperture (22), so as to allow adjustment via the aperture (22) by means of a tool which engages in the receptacle (23), for example by means of a screwdriver.

21. The device for adjusting rotation angles as
claimed in claim 16 , characterized in
that the adjusted position of the magnet (4) can be
5 connected to the rotor (3) such that it cannot rotate,
in particular by the magnet (4) and/or the intermediate
piece (21) being adhesively bonded, welded, cast or the
like to the rotor (3) after adjustment.

10 22. The device for adjusting rotation angles as
claimed in claim 16 , characterized in
that the magnet (4) is composed of a material which has
magnetic particles and plastic, preferably with the
material being molded, in particular injection molded,
15 in the form of a body such that the body at the same
time represents the intermediate piece (21) and the
magnet (4).